

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-10: (Cancelled)

11. (Previously Presented): A process of producing gasoline with a low sulfur content from a gasoline feedstock containing sulfur compounds, diolefins, olefins, aromatics, nitrogen and acetylenic compounds, said process comprising at least the following steps:

- (a1) conducting at least one selective hydrogenation of diolefins and acetylenic compounds contained in the feedstock, wherein in step (a1) the hydrogen to feedstock ratio is 8 -30 liters of hydrogen per liter of feedstock,
- (b) conducting at least one separation of effluent obtained at the end of step (a1) into at least three fractions: a light fraction containing olefins, and from which substantially all of the sulfur has been removed, a heavy fraction in which most of the sulfur compounds initially contained in the gasoline feedstock is concentrated, and at least one intermediate fraction,
- (c1) conducting at least one treatment of the heavy fraction separated at step (b) on a catalyst enabling the sulfur compounds to be at least partially decomposed or hydrogenated, and
- (d) conducting at least one step to remove sulfur and nitrogen from at least one intermediate fraction.

12. (Previously Presented): A process as claimed in claim 11, further comprising at least one step (a2) prior to step (b) of increasing the molecular weight of sulfur compounds present in at least one of the feedstock or the effluent from step (a1).

13. (Previously Presented): A process as claimed in claim 11, further comprising a step (c2) of treating effluent from step (c1) on a catalyst to decompose sulfur compounds.

14. (Previously Presented): A process as claimed in claim 13, in which the hydrogenation of olefins in said effluent of (c1) is limited to less than 20% by volume.

15. (Previously Presented): A process as claimed in claim 13, further comprising a step (e) of mixing at least two of said fractions, at least one of which was desulfurized at step (c1) and optionally (c2), or step (d).

16. (Previously Presented): A process as claimed in claim 11, in which a part of at least one intermediate fraction obtained from step (b) is mixed with the heavy fraction from step (b) prior to step (c1).

17. (Previously Presented): A process as claimed in claim 11, in which a part of at least one intermediate fraction obtained at step (b) is mixed with effluent from step (c1).

18. (Previously Presented): A process as claimed in claim 11, in which step (d) during which sulphur and nitrogen are removed, further comprises hydrogenation of the olefins.

19. (Previously Presented): A process as claimed in claim 11, in which the feedstock is a gasoline cut from a catalytic cracking unit.

20. (Previously Presented): A process as claimed in claim 13, in which step (b) comprises separating effluent obtained from step (a1) into four fractions: a light fraction, a heavy fraction and two intermediate fractions, treating one of the intermediate fractions at step (d), and mixing the other intermediate fraction with the heavy fraction separated at step (b) before said heavy fraction is treated in step (c1) and/or step (c2).

21. (Previously Presented): A process according to claim 11, further comprising subjecting effluent from at least one intermediate fraction of step (d) to catalytic reforming.

22. (Cancelled):

23. (Previously Presented): A process according to claim 11, wherein the sulfur compounds in the gasoline feedstock comprise ethyl mercaptan, propyl mercaptan, thiophen, CS₂, dimethyl sulphide, methylethyl sulphide, or COS.

24. (Previously Presented): A process according to claim 11, wherein the sulfur compounds in the gasoline feedstock comprise compounds with a boiling point lower than thiophen.

25. (Previously Presented): A process of producing gasoline with a low sulfur content from a gasoline feedstock comprising sulfur compounds, diolefins, olefins, aromatics, nitrogen and acetylenic compounds, said process comprising at least the following steps:

- (a1) conducting at least one selective hydrogenation of diolefins and acetylenic compounds comprised in the feedstock, wherein in step (a1) the hydrogen to feedstock ratio is 8 -30 liters of hydrogen per liter of feedstock,
- (a2) increasing the molecular weight of sulfur compounds present in at least one of the feedstock or the effluent from step (a1),
- (b) conducting at least one separation of effluent obtained at the end of step (a1) or (a2) into at least three fractions: a light fraction comprising olefins, and from which substantially all of the sulfur has been removed, a heavy fraction in which most of the sulfur compounds initially comprised in the gasoline feedstock is concentrated, and at least one intermediate fraction,
- (c1) conducting at least one treatment of the heavy fraction separated at step (b) on a catalyst enabling the sulfur compounds to be at least partially decomposed or hydrogenated,
- (d) conducting at least one step to remove sulfur and nitrogen from at least one intermediate fraction, and
- (e) mixing at least two of the fractions, at least one of which was desulfurized at step

(c1) or step (d).

26. (Previously Presented): A process of producing gasoline with a low sulfur content from a gasoline feedstock comprising sulfur compounds, diolefins, olefins, aromatics, nitrogen and acetylenic compounds, said process comprising at least the following steps:

- (a1) conducting at least one selective hydrogenation of diolefins and acetylenic compounds comprised in the feedstock, wherein in step (a1) the hydrogen to feedstock ratio is 8 -30 liters of hydrogen per liter of feedstock,
- (a2) increasing the molecular weight of sulfur compounds present in at least one of the feedstock or the effluent from step (a1),
- (b) conducting at least one separation of effluent obtained at the end of step (a1) or (a2) into at least three fractions: a light fraction comprising olefins, and from which substantially all of the sulfur has been removed, a heavy fraction in which most of the sulfur compounds initially comprised in the gasoline feedstock is concentrated, and at least one intermediate fraction having a depleted content of olefins and aromatics,
- (c1) conducting at least one treatment of the heavy fraction separated at step (b) on a catalyst enabling the sulfur compounds to be at least partially decomposed or hydrogenated,
- (c2) treating effluent from step (c1) on a catalyst so as to decompose the sulfur compounds, and
- (d) conducting at least one step to remove sulfur and nitrogen from at least one intermediate fraction,

wherein a part of said at least one intermediate fraction obtained from step (b) is mixed with the heavy fraction prior to step (c1).

27. (Previously Presented): A process of producing gasoline with a low sulfur content from a gasoline feedstock comprising sulfur compounds, diolefins, olefins, aromatics, nitrogen and acetylenic compounds, said process comprising at least the following steps:

- (a1) conducting at least one selective hydrogenation of diolefins and acetylenic compounds comprised in the feedstock, wherein in step (a1) the hydrogen to feedstock ratio is 8 -30 liters of hydrogen per liter of feedstock,
- (a2) increasing the molecular weight of sulfur compounds present in at least one of the feedstock or the effluent from step (a1),
- (b) conducting at least one separation of effluent obtained at the end of step (a1) or (a2) into at least three fractions: a light fraction comprising olefins, and from which substantially all of the sulfur has been removed, a heavy fraction in which most of the sulfur compounds initially comprised in the gasoline feedstock is concentrated, and at least one intermediate fraction,
- (c1) conducting at least one treatment of the heavy fraction separated at step (b) on a catalyst enabling the sulfur compounds to be at least partially decomposed or hydrogenated, and mixing a part of at least one intermediate fraction obtained at step (b) with effluent from step (c1),
- (c2) treating effluent from step (c1) on a catalyst so as to decompose the sulfur compounds, and
- (d) conducting at least one step to remove sulfur and nitrogen from at least one intermediate fraction.

28. (Previously Presented): A process according to claim 29, further comprising increasing the molecular weight of sulfur compounds present in at least one of the feedstock or the effluent from the selective hydrogenation.

29. (Previously Presented): A process for producing gasoline with a low sulfur content from a gasoline feedstock comprising:

conducting at least one selective hydrogenation of diolefins and acetylenic compounds comprised in the feedstock, wherein in said at least one selective hydrogenation the hydrogen to feedstock ratio is 8 -30 liters of hydrogen per liter of feedstock;

separating an effluent of the at least one selective hydrogenation into at least three

fractions; and

conducting at least one treatment of one of the fractions separated on a catalyst enabling the sulfur compounds to be at least partially decomposed or hydrogenated.

30. (Previously Presented): A process for producing gasoline with a low sulfur content from a gasoline feedstock comprising:

conducting at least one selective hydrogenation of diolefins and acetylenic compounds comprised in the feedstock, wherein in said at least one selective hydrogenation the hydrogen to feedstock ratio is 8 -30 liters of hydrogen per liter of feedstock;

separating an effluent of the at least one selective hydrogenation into at least three fractions; and

removing sulfur and nitrogen from at least one of the separated fractions.

31. (Previously Presented): A process according to claim 29, wherein the fractions comprise a light fraction, an intermediate fraction, and a heavy fraction.

32. (Previously Presented): A process according to claim 30, further comprising increasing the molecular weight of sulfur compounds present in at least one of the feedstock or the effluent from the selective hydrogenation.

33. (Previously Presented): A process according to claim 30, wherein the fractions comprise a light fraction, an intermediate fraction, and a heavy fraction.

34. (Previously Presented): A process as claimed in claim 11, further comprising at least one step (a2) prior to step (b) of increasing the molecular weight of sulfur compounds present in the effluent from step (a1).

35. (Previously Presented): A process as claimed in claim 34, in which a part of at least one intermediate fraction obtained from step (b) is mixed with the heavy fraction from step

(b) prior to step (c1).

36. (Currently Amended): A process as claimed in claim 26 34, in which a part of at least one intermediate fraction obtained at step (b) is mixed with effluent from step (c1) prior to step (c2).

37. (Previously Presented): A process as claimed in claim 34, in which step (b) comprises separating effluent obtained from step (a1) into four fractions: a light fraction, a heavy fraction and two intermediate fractions, treating one of the intermediate fractions at step (d), and mixing the other intermediate fraction with the heavy fraction separated at step (b) before said heavy fraction is treated in step (c1) and/or step (c2).

38. (Previously Presented): A process according to claim 25, wherein step (a2) is performed on the effluent of step (a1).

39. (Previously Presented): A process as claimed in claim 38, in which a part of at least one intermediate fraction obtained from step (b) is mixed with the heavy fraction from step (b) prior to step (c1).

40. (Previously Presented): A process as claimed in claim 38, in which a part of at least one intermediate fraction obtained at step (b) is mixed with effluent from step (c1) prior to step (c2).

41. (Previously Presented): A process according to claim 26, wherein step (a2) is performed on the effluent of step (a1).

42. (Previously Presented): A process according to claim 27, wherein step (a2) is performed on the effluent of step (a1).

43. (Previously Presented): A process according to claim 13, wherein steps (c1) and (c2) are performed in a single reactor.

44. (Previously Presented): A process according to claim 13, wherein steps (c1) and (c2) are performed in two separate reactors.

45. (Previously Presented): A process according to claim 12, wherein steps (a1) and (a2) are performed simultaneously.

46. (Previously Presented): A process of producing gasoline with a low sulfur content from a gasoline feedstock containing sulfur compounds, diolefins, olefins, aromatics, nitrogen and acetylenic compounds, said process comprising at least the following steps:

- (a1) conducting at least one selective hydrogenation of diolefins and acetylenic compounds contained in the feedstock,
- (b) conducting at least one separation of effluent obtained at the end of step (a1) into at least three fractions: a light fraction containing olefins, and from which substantially all of the sulfur has been removed, a heavy fraction in which most of the sulfur compounds initially contained in the gasoline feedstock is concentrated, and at least one intermediate fraction,
- (c1) conducting at least one treatment of the heavy fraction separated at step (b) on a catalyst enabling the sulfur compounds to be at least partially decomposed or hydrogenated, and
- (d) conducting at least one step to remove sulfur and nitrogen from at least one intermediate fraction.